Wisconsin Electric Utility Sales, by Economic Sector

TOTAL ELECTRICITY SALES
3.6%

Total electricity sales increased 3.6 percent in 2010 and have grown 6.3 percent over the past ten years. In 2010, electricity sales increased in all sectors with the highest increase of 4.5 percent in the industrial sector.

A map of Wisconsin's major electric lines and service territory areas can be found in the Map Appendix.

1970-2010 MILLIONS OF kWh AND PERCENT OF TOTAL

Year	Residential		Commercial[a]		Industrial		Agricultural[c,d]		Total[e]
1970	8,761	*35.4%*	5,738	*23.2%*	9,188	*37.2%*	1,028	*4.2%*	24,715
1975	10,893	*34.8%*	8,452	*27.0%*	10,721	*34.3%*	1,210	*3.9%*	31,276
1980	12,513	*33.2%*	11,243	*29.8%*	12,450	*33.0%*	1,539	*4.1%*	37,745
1985	13,257	*31.8%*	12,783	*30.6%*	13,940	*33.4%*	1,745	*4.2%*	41,725
1990[b]	14,740	*30.0%*	15,808	*32.1%*	17,005	*34.6%*	1,645	*3.3%*	49,198
1995	17,040	*29.4%*	18,042	*31.1%*	21,290	*36.7%*	1,595	*2.8%*	57,967
1996	17,100	*29.1%*	18,588	*31.6%*	21,471	*36.6%*	1,585	*2.7%*	58,744
1997	16,935	*28.2%*	18,881	*31.4%*	22,703	*37.8%*	1,575	*2.6%*	60,094
1998	17,522	*28.2%*	19,334	*31.2%*	23,640	*38.1%*	1,565	*2.5%*	62,061
1999	17,942	*28.2%*	20,781	*32.7%*	23,264	*36.6%*	1,560	*2.5%*	63,547
2000	18,199	*28.1%*	21,407	*33.1%*	23,528	*36.4%*	1,555	*2.4%*	64,689
2001	18,990	*28.8%*	21,614	*32.8%*	23,823	*36.1%*	1,550	*2.3%*	65,977
2002[f]	20,030	*29.9%*	22,290	*33.3%*	23,134	*34.5%*	1,545	*2.3%*	66,999
2003	21,364	*31.8%*	20,056	*29.8%*	24,226	*36.0%*	1,595	*2.4%*	67,241
2004	21,120	*31.2%*	19,951	*29.4%*	25,228	*37.2%*	1,501	*2.2%*	67,800
2005	21,385	*30.4%*	21,968	*31.2%*	25,376	*36.1%*	1,606	*2.3%*	70,335
2006[r]	20,729	*29.7%*	22,232	*31.8%*	25,286	*36.2%*	1,574	*2.3%*	69,821
2007	21,454	*30.1%*	23,032	*32.3%*	25,436	*35.7%*	1,379	*1.9%*	71,301
2008	20,986	*29.9%*	22,978	*32.8%*	24,672	*35.2%*	1,486	*2.1%*	70,122
2009[r]	20,458	*30.9%*	21,995	*33.2%*	22,390	*33.8%*	1,443	*2.2%*	66,286
2010[p]	**21,323**	***31.0%***	**22,514**	***32.7%***	**23,452**	***34.1%***	**1,463**	***2.1%***	**68,752**

a Includes sales to public authorities (including sales for street and highway lighting) and utility company interdepartmental sales (for example, from electric to gas department of a combined utility).

b Beginning in 1989, U.S. DOE data sources have been used.

c Beginning in 2003, USDA agricultural statistics were used to electricity sales to this sector. To accommodate this shift in data sources, numbers in the residential and agricultural sectors have been historically revised.

d The agricultural sector does not include processing plants for crops and other agricultural products; these are classified under the commercial sector.

e Total sales may vary from other pages due to independent rounding.

f In 2002, EIA shifted their commercial and industrial criteria. Previous editions of this publication corrected for this shift, but revisions based on availability of firm agricultural electric consumption data prompted a historical revision starting in 1989. This publication no longer corrects for shifts in EIA data collection methods which are reflected in 2003.

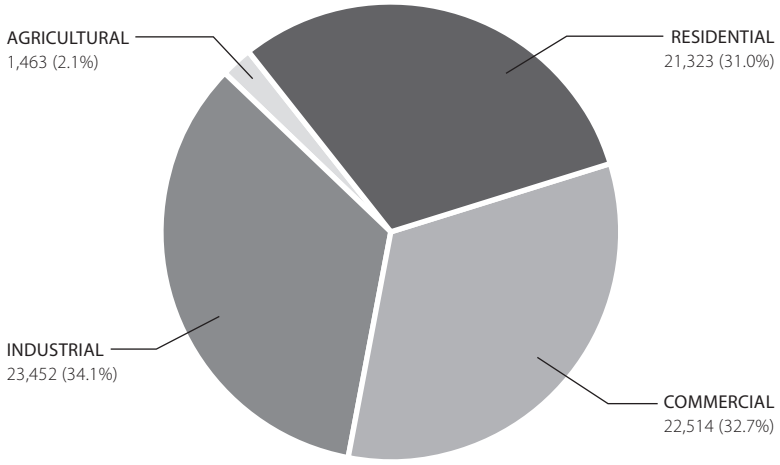
p Preliminary estimates.

r Revised.

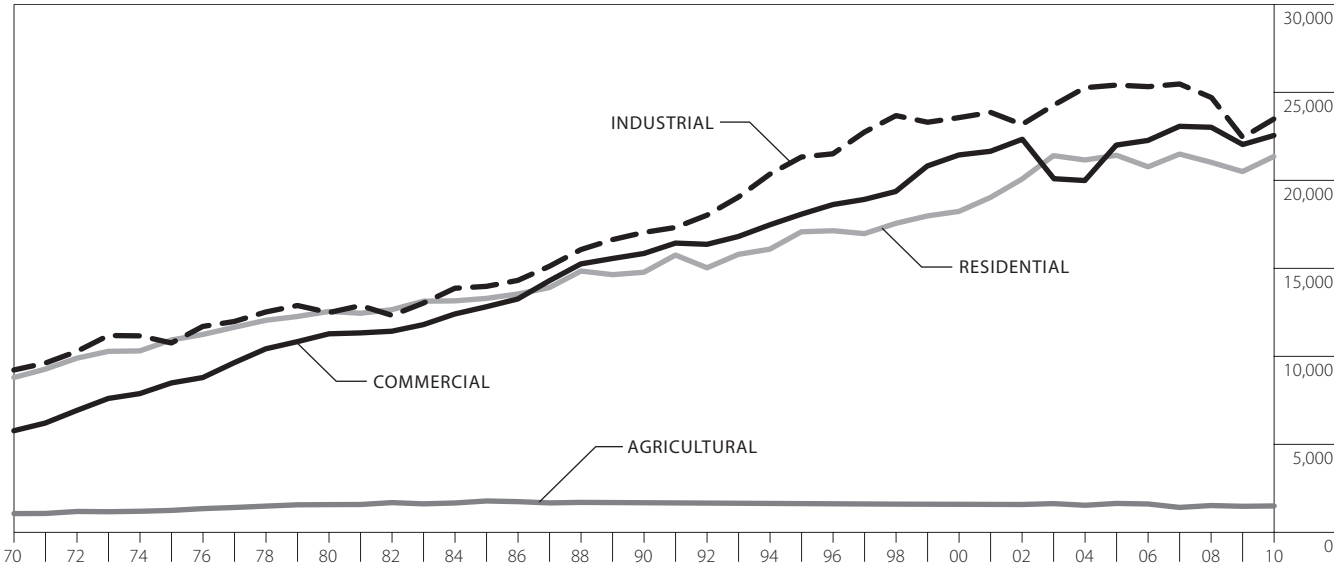
Source: Sectoral disaggregation by Wisconsin Office of Energy Independence, based on Public Service Commission of Wisconsin, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1970-1994); U.S. Department of Agriculture, Rural Electrification Administration, Annual Statistical Report, REA Bulletin 1-1 (1970-1994); U.S. Department of Energy, Electric Sales and Revenue 1989-1999 [DOE/EIA-0540 (99)] (October 2000), *Electric Power Monthly*, Table 5.4B [DOE/EIA-0226 (2012/02)] (February 2012) (1989-2010). http://www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html; U.S. Department of Agriculture, Economic Research Service, electricity expenditure data at http://www.ers.usda.gov/ (2007-2010).

Wisconsin Electric Utility Sales, by Economic Sector

2010 MILLIONS OF kWh AND PERCENT OF TOTAL



1970-2010 MILLIONS OF kWh



Source: Wisconsin State Energy Office.

Wisconsin Electricity Sales to Ultimate Customers, by Private and Municipal Utilities and Power Cooperatives

Investor owned utilities supply the vast majority of power to Wisconsin electricity customers (83.2 percent). The relative amounts of power supplied by the three types of suppliers have changed very little over the past 20 years.

1970-2010 MILLIONS OF kWh AND PERCENT OF TOTAL

Year	Private Utilities		Municipal Utilities		Power Cooperatives		Total
1970	21,515	*87.1%*	2,160	*8.7%*	1,040	*4.2%*	24,715
1975	27,021	*86.4%*	2,784	*8.9%*	1,471	*4.7%*	31,276
1980	32,335	*85.7%*	3,547	*9.4%*	1,864	*4.9%*	37,746
1985	35,497	*85.1%*	4,132	*9.9%*	2,096	*5.0%*	41,725
1990[a]	41,653	*84.7%*	5,263	*10.7%*	2,282	*4.6%*	49,198
1995	48,814	*84.2%*	6,479	*11.2%*	2,674	*4.6%*	57,967
1996	49,332	*84.0%*	6,635	*11.3%*	2,777	*4.7%*	58,744
1997	50,640	*84.3%*	6,627	*11.0%*	2,827	*4.7%*	60,094
1998	52,242	*84.2%*	6,992	*11.3%*	2,827	*4.6%*	62,061
1999	53,517	*84.2%*	7,215	*11.4%*	2,815	*4.4%*	63,547
2000	54,404	*84.1%*	7,375	*11.4%*	2,910	*4.5%*	64,689
2001	55,545	*84.2%*	7,349	*11.1%*	3,083	*4.7%*	65,977
2002	56,250	*84.0%*	7,523	*11.2%*	3,226	*4.8%*	66,999
2003	56,459	*84.0%*	7,500	*11.2%*	3,282	*4.9%*	67,241
2004	57,099	*84.0%*	7,598	*11.2%*	3,279	*4.8%*	67,976
2005	58,899	*83.7%*	7,950	*11.3%*	3,487	*5.0%*	70,336
2006[r]	58,407	*83.7%*	7,902	*11.3%*	3,512	*5.0%*	69,821
2007	59,585	*83.6%*	8,079	*11.3%*	3,637	*5.1%*	71,301
2008	58,429	*83.3%*	7,947	*11.3%*	3,746	*5.3%*	70,122
2009	55,051	*83.1%*	7,485	*11.3%*	3,750	*5.7%*	66,286
2010[p]	**57,183**	***83.2%***	**7,759**	***11.3%***	**3,810**	***5.5%***	**68,752**

a Beginning in 1989, U.S. DOE data sources have been used.

p Preliminary estimates.

r Revised.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8, Table 5 (1970-1994); U.S. Department of Agriculture, Rural Electrification Administration, *Annual Statistical Report*, REA Bulletin 1-1, Table 31 (1970-1994); U.S. Department of Energy, *Electric Sales and Revenue 1989-2000* [DOE/EIA-0540 (2000)] (November 2001), and *Electric Power Monthly* [DOE/EIA-0226 (2012/02)] (February 2012). www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html

Eastern Wisconsin Electric Utility Power Load and Non-Coincident Peak Demand

Non-coincident peak demand is the sum of the individual monthly peak electric demands from Wisconsin's eastern utilities.

1970-2010

Year	Load (Millions of kWh)	Peak Demand Summer (MW)	Peak Demand Winter (MW)	Capacity Factor[b] (Percent)
1970	22,818	4,125	3,964	63.1
1975	28,616	5,314	4,903	61.5
1980	34,836	6,009	5,525	66.0
1985	39,325	6,464	6,166	69.4
1990[c]	47,381	8,326	7,210	65.0
1995	55,821	9,833	8,275	64.8
1996	58,408	9,061	8,285	73.4
1997	59,946	9,313	8,302	73.5
1998	59,563	10,099	8,644	67.3
1999	61,990	10,756	8,977	65.8
2000	64,084	10,814	9,152	67.6
2001	61,701	11,645	8,440	60.5
2002	67,698	11,401	8,917	67.8
2003	68,886	11,688	9,192	67.3
2004	68,296	10,981	9,729	70.8
2005	70,441	11,946	9,595	67.3
2006	67,216	12,129	9,238	63.3
2007[r]	68,796	11,698	9,237	67.1
2008[r]	66,931	11,060	9,482	68.9
2009	63,349	11,267	9,114	64.2
2010[p]	**65,092**	**11,568**	**9,036**	**64.2**

a Wisconsin Electric Power Co., Wisconsin Power and Light Co., Wisconsin Public Service Corp., and Madison Gas and Electric Co.

b Capacity Factor = Annual Energy Generation (kWh) / [Peak Demand (kW) x 8,760 (hours/year)]

c Beginning in January 1988, data includes Wisconsin Electric Power Co. generation from Presque Isle, Michigan.

p Preliminary estimates.

r Revised.

Source: Wisconsin electric utility annual reports submitted to the Public Service Commission of Wisconsin (1970-2010); http://psc.wi.gov/apps40/annlreport/default.aspx

SUMMER PEAK DEMAND 2.7%

Wisconsin's 2010 summer peak electricity demand for the eastern Wisconsin utilities[a] increased 2.7 percent due to warmer weather in August. The increase compared to 2009 was 301 megawatts.

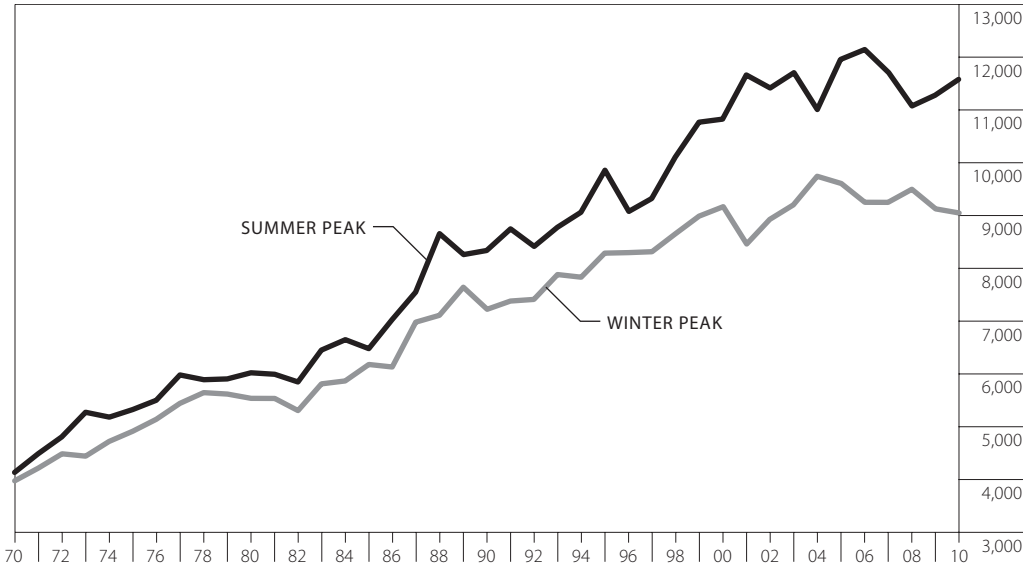
WINTER PEAK DEMAND 0.9%

Winter peak demand decreased 0.9 percent in 2010 due to warmer December weather. Summer peak demand in 2010 exceeded winter peak demand by 2,532 megawatts. Winter peak demand includes November through February. Because these data are presented annually, winter peak demand in this chart only includes November and December 2010; the peak demand will be adjusted to include January and February in the next edition of this publication.

Eastern Wisconsin Electric Utility Non-Coincident Peak Demand

HIGHEST PEAK
12,129
MEGAWATTS
SUMMER 2006

1970-2010 MEGAWATTS



Eastern Wisconsin Electric Utility Power Load and Non-Coincident Peak Demand, by Month

The highest non-coincident peak demand in 2010 was seen in August.

2010

Month	Load (Millions of kWh)[a]	Non-Coincident Peak Demand (MW)[b]
January	5,802	8,764
February	5,041	8,422
March	5,142	7,975
April	4,823	7,403
May	5,252	10,136
June	5,550	10,273
July	6,406	10,696
August	6,388	11,568
September	5,116	9,717
October	4,993	7,863
November	4,971	8,212
December	5,608	9,036
Total	**65,092**	

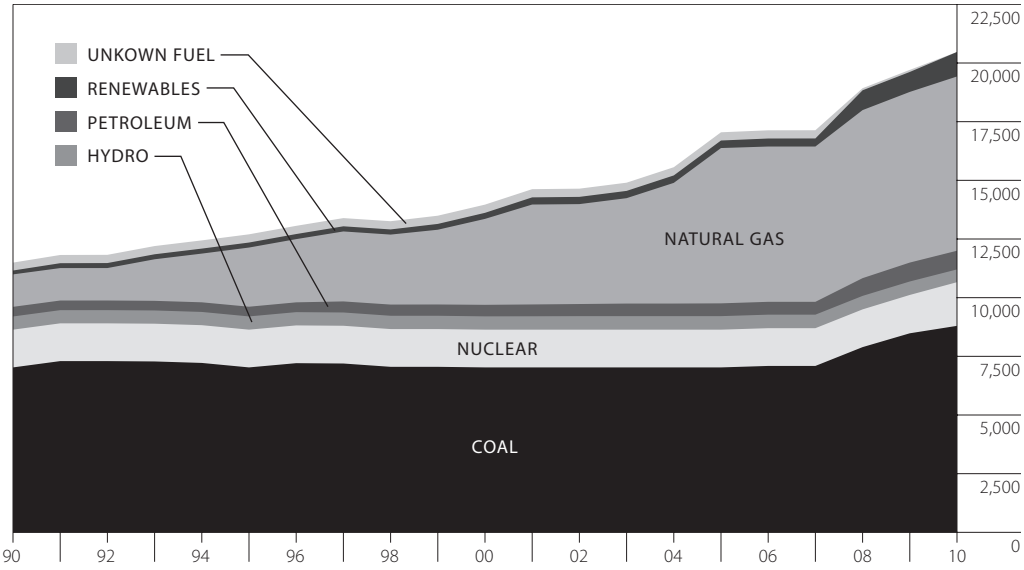
a Wisconsin Electric Power Co., Wisconsin Power and Light Co., Wisconsin Public Service Corp., and Madison Gas and Electric Co.

b Non-coincident peak demand is the sum of the individual monthly peak electric demands from the four utilities listed above for each month.

Source: Wisconsin electric utility annual reports submitted to the Public Service Commission of Wisconsin (2010). http://psc.wi.gov/apps40/annlreport/default.aspx

Wisconsin Electric Generating Capacity, by Type of Plant

1990-2010 MEGAWATTS



Year	Coal	Nuclear	Hydro	Petroleum	Natural Gas	Renewables	Unknown Fuel	Total[a,b]
1990	7,028	1,609	562	410	1,383	165	337	11,494
1995	7,028	1,609	564	413	2,522	213	350	12,700
1996	7,209	1,609	566	417	2,694	216	350	13,062
1997	7,194	1,609	566	471	2,982	219	350	13,391
1998	7,053	1,609	567	477	2,982	220	350	13,258
1999	7,053	1,609	567	481	3,185	248	350	13,494
2000	7,028	1,609	567	491	3,662	258	350	13,965
2001	7,028	1,609	571	503	4,258	305	350	14,624
2002	7,028	1,609	576	516	4,258	308	350	14,646
2003	7,028	1,609	576	536	4,491	310	350	14,900
2004	7,028	1,609	576	536	5,143	317	350	15,560
2005	7,028	1,609	576	545	6,618	321	350	17,048
2006	7,091	1,609	576	547	6,618	341	350	17,133
2007	7,091	1,609	576	547	6,618	344	350	17,137
2008	7,893	1,608	575	756	7,161	844	89	18,925
2009	8,482	1,634	574	806	7,272	850	89	19,706
2010[p]	**8,799**	**1,861**	**544**	**796**	**7,426**	**1,044**	**0**	**20,470**

a Capacity is as of December 31 of each year.

b Totals might not add due to rounding.

p Preliminary.

Sources: Energy Information Administration, *Electric Power Annual*, [DOE/EIA-0348(2007)](October 2007), http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html. In 2008, this table was historically revised with data from the Public Service Commission of Wisconsin. PSC/Wisconsin Generating Capacity by Fuel (1990-2010); EIA data were used in previous publications.

ELECTRIC GENERATION CAPACITY

764

MEGAWATTS (3.9 PERCENT) IN 2010

In 2010, Wisconsin's electric generation capacity increased by 764 megawatts (3.9 percent). These data represent electricity generation capacity by Wisconsin's investor-owned utilities, municipal utilities, electric co-operatives, independent power producers, and other non-utility operations (e.g., paper mills).

The Renewables data include biomass (e.g., wood, paper byproducts, landfill gas, and methane digester gas), solar and wind. Out-of-state facilities owned and/or operated by Wisconsin utilities are not included in the Renewables or the hydroelectric figures. These figures include renewable facilities that are not RPS-registered.

Wisconsin Electric Generating Capacity, by Type of Plant and Type of Producer

2010 saw an overall capacity increase of 3.9 percent over 2009. The increases according to producers were: Investor Owned Utilities (IOUs), 6.8 percent and Independent Power Producers (IPPs), 5.6 percent; and power co-operatives, 1.3 percent. The following producers saw a net decrease in their generation capacity: municipal utilities 0.2 percent, and non-utilities, 31.8 percent. The large decrease in capacity for non-utilities is likely due to closings of large industrial power producers.

These data were not available until 1990; the capacity listed for 1990 represents in-place capacity for all previous years of operation.

1990-2010 MEGAWATTS

These data represent the generation capacity of utilities, who are required to have power available to customers via the power grid; and merchant producers who produce power for wholesale (Independent Power Producers) to utilities; and non-utilities which are primarily industrial sector businesses producing electricity for in-house use, any excess of which may also be sold to utilities for retail re-sale on the power grid.

	Utility Generating Capacity[c]				Non-Utility Generating Capacity			All Producers Capacity Total
Year	Cooperatives	Investor-Owned Utilities	Municipal	Utility Total	IPP[a]	Non-Utility[b]	Non-Utility Total	
1990	937	9,404	204	10,544	62	889	951	11,494
1991	937	9,352	203	10,492	62	916	977	11,469
1992	937	9,352	203	10,492	62	921	983	11,475
1993	937	9,627	289	10,852	62	922	983	11,836
1994	937	9,904	289	11,129	62	922	983	12,113
1995	937	10,452	290	11,678	62	960	1,022	12,700
1996	937	10,379	375	11,691	62	936	998	12,689
1997	937	10,432	376	11,744	350	939	1,289	13,033
1998	937	10,433	382	11,751	530	939	1,469	13,220
1999	937	10,455	410	11,801	830	946	1,775	13,577
2000	937	10,794	421	12,151	830	984	1,814	13,965
2001	1,033	10,798	432	12,263	1,361	1,000	2,361	14,624
2002	1,033	10,804	440	12,277	1,362	1,008	2,370	14,647
2003	1,033	11,057	440	12,530	1,362	1,008	2,371	14,901
2004	1,036	11,058	492	12,586	1,961	1,013	2,974	15,560
2005	1,037	11,098	501	12,636	3,397	1,015	4,412	17,048
2006	1,037	11,098	566	12,702	3,397	1,034	4,431	17,133
2007	1,037	10,024	566	11,628	4,471	1,038	5,509	17,137
2008	1,017	11,201	566	12,784	5,036	1,016	6,052	18,836
2009	1,017	11,960	566	13,543	5,071	1,092	6,163	19,706
2010[p]	**1,030**	**12,772**	**565**	**14,367**	**5,357**	**745**	**6,102**	**20,469**

a IPPs are independent power producers allowed under law to sell their power to wholesalers such as utility co-operatives. They are barred from selling their power on the retail market.

b Non-utility sources refers to industrial power producers such as paper mills.

c Utilities include investor-owned utilities, electric co-operatives and municipalities.

p Preliminary.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Generating Plants Operated by Wisconsin Electric Utilities*, Bulletin #46 (1971-1994) and personal communications 2002; U.S. Department of Agriculture, Rural Electrification Administration, *Annual Statistical Report*, REA Bulletin 1-1 (1971-1994); Public Service Commission of Wisconsin, unpublished electrical generation data (1990-2010).

Wisconsin Electric Power Generation, by Type of Plant

Utilities include investor-owned utilities, electric co-operatives and municipalities.

IPPs are independent power producers allowed under law to sell their power to wholesalers such as utility co-operatives. They are barred from selling their power on the retail market. The primary fuel used by IPPs is uranium, followed by natural gas, wind, and hydroelectric.

Non-Utility refers to industrial power producers such as paper mills. These generation facilities primarily use coal and renewable resources such as biogas and hydroelectric to generate electricity for their own use.

1970-2010 MILLIONS OF kWh

	Electricity Generation by Utilities[e]											
Year	Coal[b]	Nuclear[g]	Hydro[a]	Petroleum[d]	Natural Gas	Renewables[f]	Total Utilities	IPP	Nonutility[e]	Total IPP and Nonutility	Imports & Losses[c]	Total Sales[h]
1970	25,253	155	1,413	390			27,211			0	-2,496	24,715
1975	20,615	10,292	1,483	691			33,081			0	-1,805	31,276
1980	26,383	9,912	1,628	393			38,316			0	-571	37,745
1985	28,840	10,978	2,046	20			41,884			0	-159	41,725
1990	27,956	11,224	1,791	76	393		41,440			0	7,758	49,198
1995	32,994	10,970	2,097	97	924		47,082			0	10,885	57,967
2000	41,736	11,459	1,749	52	965	43	56,004			0	8,685	64,689
2001	40,855	11,507	1,888	99	815	51	55,215	2		2	10,760	65,977
2002	42,368	12,449	2,283	43	910	62	58,115	0		0	8,884	66,999
2003	44,140	12,220	1,623	93	1,008	62	59,146	404		404	7,691	67,241
2004	45,149	11,888	1,748	56	574	69	59,484	0		0	8,316	67,800
2005	45,219	7,574	1,499	75	2,185	105	56,657	2,648	275	2,923	11,031	70,336
2006[r]	42,936	12,234	1,446	215	1,928	234	58,993	3,662	2,534	6,196	7,166	69,821
2007	39,460	0	1,330	123	3,132	277	44,322	16,263	2,913	19,176	10,715	71,301
2008[r]	41,270	0	1,445	70	2,451	508	45,743	15,126	2,874	18,000	9,252	70,122
2009[r]	36,554	0	1,242	38	2,597	997	41,428	16,027	2,687	18,713	8,831	66,286
2010[p]	**39,427**	**0**	**1,905**	**39**	**3,164**	**817**	**45,351**	**16,193**	**2,783**	**18,976**	**7,208**	**68,752**

a From 1970 to 1989, hydroelectric data were sourced from the Public Service Commission of Wisconsin bulletins; from 1990 to 2006, and for the current year, data are from the federal Department of Energy, Energy Information Administration (EIA). 2007, 2008 and data for the previous year are from the Public Service Commission of Wisconsin.

b Coal data may include a small amount of refuse derived fuel for all producer types.

c A negative sign indicates Wisconsin utilities exported electric power to other states.

d Petroleum (oil) was split from natural gas as a generation resource starting in 1990. Prior to 1990, they were combined in this table. Propane used to produce electricity is included in this category.

e Non-utility generation sources were available prior to 2005, but not collected separately until then.

f The renewables category includes biomass, methane from landfills and digesters, solar and wind resources. In 2009, the renewables category also includes undifferentiated renewables. These renewables are not split out by type of fuel due to data source limitations.

g Wisconsin utilities no longer own nuclear generation; all nuclear reactors located in Wisconsin are owned by Independent Power Producers. Nuclear generation data can be found in the IPP category in the above table.

h Sales figures for all years are from the EIA Electric Power Monthly.

p Preliminary.

r Revised.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Generating Plants Operated by Wisconsin Electric Utilities*, Bulletin #46 (1971-1994) and personal communications 2002; U.S. Department of Agriculture, Rural Electrification Administration, *Annual Statistical Report*, REA Bulletin 1-1 (1971-1994); US Department of Energy, Energy Information Administration, *Electric Power Monthly* [DOE/EIA-0226 (2010/03)] (March 2010) (1990-2006); Public Service Commission of Wisconsin, unpublished electrical generation data (2007-2010).

ELECTRIC UTILITY GENERATION 9.5%

Total electric generation by Wisconsin utilities increased 9.5 percent in 2010, while generation from Independent Power Producers (IPPs) increased by 1.0 percent. Industrial, or non-utility, generation increased by 3.6 percent. The percent of Wisconsin's power that is produced in-state has been gradually increasing since 2007 as in-state capacity has grown and imports have decreased. In 2010, 93.6 percent of Wisconsin's power was produced in-state, and power imports decreased by 18.4 percent.

Utility energy production from renewable sources decreased by 18.1 percent in 2010, while production from coal decreased by 7.9 percent.

The "Imports and Losses" column is a reflection of the difference between total sales recorded by EIA and total sales reported by utilities and IPPs.

Wisconsin Electric Utility Fuel Costs of Power Generation, by Type of Plant

In this table, only the cost of fuel per kilowatt-hour of generation is reported. The table on the next page includes the annual variable cost of generation. Renewables such as hydroelectric plants, wind turbines and solar photovoltaic installations are not included here because they have no associated fuel costs.

Wisconsin utilities no longer own nuclear generation; all nuclear reactors located in Wisconsin are owned by Independent Power Producers. The data for 2005 and 2006 show a decline in fuel costs for nuclear generation because these are the years in which the sales of the plants were completed. Fuel cost data for nuclear plants are no longer available because these plants are owned by Independent Power Producers who do not submit annual reports to the Public Service Commission.

The costs in the table below reflect costs incurred by Wisconsin's five largest investor owned utilities.

1970-2010 CENTS PER kWh

Year	Fossil Fuel Steam (Coal)	Nuclear Steam[b]	Internal Combustion[a]	Total
1970	0.43	0.16	0.75	0.44
1975	1.01	0.36	1.47	0.75
1980	1.72	0.50	3.58	1.40
1985	2.02	0.61	6.76	1.60
1990[e]	1.61	0.52	4.51	1.27
1995[e]	1.33	0.48	3.62	1.12
1996[e]	1.26	0.49	3.15	1.07
1997[e]	1.28	0.50	4.30	1.22
1998[e]	1.25	0.52	3.76	1.13
1999[e]	1.21	0.53	3.70	1.07
2000[e]	1.24	0.52	6.41	1.14
2001[e]	1.27	0.54	6.36	1.15
2002[e]	1.31	0.50	4.61	1.12
2003[e]	1.37	0.48	6.49	1.21
2004[e]	1.44	0.47	6.19	1.24
2005[e]	1.58	0.39	10.29	1.65
2006[e]	1.78	0.35	8.28	1.61
2007[e]	2.00	0.27	7.49	1.84
2008[e]	2.21	Not Available	7.14	1.89
2009[e]	2.33	Not Available	4.52	1.81
2010[e]	**2.41**	**Not Available**	**3.70**	**1.85**

a Internal combustion includes both gas-powered turbines and diesel-powered engines.

b Nuclear cost.

e Estimate by Wisconsin Office of Energy Independence based on amount of generation by the five major Wisconsin utilities.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Generating Plants Operated by Wisconsin Electric Utilities*, Bulletin #46 (1971-1994); annual reports of the five major Wisconsin electric generating utilities (1990-2010). http://psc.wi.gov/apps40/annlreport/default.aspx

Utility Annual Variable Costs of Power Generation, by Type of Plant and Cost of Purchased Power

The costs in the table below reflect costs incurred by Wisconsin's five largest investor owned utilities.

1970-2010 CENTS PER kWh

Year	Fossil Fuel Steam (Coal)	Nuclear Steam[b]	Internal Combustion[a]	Hydro	All Plants	Purchased Power	Average Cost
1970	0.55	0.29	1.76	0.27	0.53	NA	NA
1975	1.25	0.51	2.73	0.32	0.97	NA	NA
1980	2.13	0.86	5.74	0.52	1.72	NA	NA
1985	2.55	1.32	19.12	0.61	2.09	NA	NA
1990[e]	2.13	1.50	10.87	1.00	1.94	2.22	1.99
1995[e]	1.80	1.63	4.71	0.71	1.75	2.17	1.83
1996[e]	1.68	1.73	4.69	0.64	1.67	2.15	1.77
1997[e]	1.68	4.37	5.09	0.69	1.94	2.27	2.04
1998[e]	1.68	2.83	4.70	1.02	1.94	2.67	2.11
1999[e]	1.68	2.03	4.83	0.87	1.79	2.96	2.05
2000[e]	1.75	2.16	7.73	0.86	1.91	3.36	2.24
2001[e]	1.76	2.37	7.63	0.90	1.95	3.90	2.41
2002[e]	1.87	2.18	6.09	0.75	1.97	3.64	2.40
2003[e]	1.91	2.40	8.02	1.12	2.10	4.05	2.61
2004[e]	1.97	2.46	14.63	1.06	2.19	4.26	2.72
2005[e]	2.11	2.64	16.02	1.21	2.74	5.25	3.48
2006[e]	2.68	2.83	14.81	1.40	3.11	5.83	3.88
2007[e]	2.94	3.05	11.76	1.65	3.42	6.29	4.22
2008[e]	3.49	4.03	13.29	1.53	4.00	6.76	4.74
2009[e]	3.77	4.25	9.84	1.81	4.22	5.78	4.65
2010[e]	**3.86**	**4.15**	**8.19**	**1.28**	**4.16**	**6.06**	**4.59**

This table shows the annual variable cost of generating one kWh of electricity by various technologies in Wisconsin's electric utility plants. The average cost is more than double the previous peak in 1983 of 2.21 cents per KWh. The cost of purchased power has risen in recent years and is 45.7 percent more expensive than electricity generated in Wisconsin.

Wisconsin utilities no longer own nuclear generation; all nuclear reactors located in Wisconsin are owned by Independent Power Producers. The figures for 2005 and 2006 show an increase in the per kWh cost of nuclear generation because these are the years in which sales of the plants were completed. Cost per kWh continues to increase for nuclear generation.

a Internal combustion includes both gas powered turbines and diesel powered engines.

b Nuclear reactors in Wisconsin are owned by independent power producers.

e Estimate by Wisconsin Office of Energy Independence based on amount of generation by the five major Wisconsin utilities.

NA – Not Available

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Generating Plants Operated by Wisconsin Electric Utilities*, Bulletin #46 (1971-1994); annual reports of the five major Wisconsin electric generating utilities (1990-2010). http://psc.wi.gov/apps40/annlreport/default.aspx

Electric Utility Sulfur Dioxide Emissions

SULFUR DIOXIDE EMISSIONS 2.3%

Utility sulfur dioxide emissions increased 2.3 percent from 2009 to 2010. Declines in total emissions will depend on the growth in coal fired generation, old plant retirement, the effectiveness of future energy efficiency efforts and increased use of natural gas and renewable energy.

1980-2010 TONS

Year	1980	1990	2000	2005	2006	2007	2008	2009[r]	2010[p]
Dairyland Power Cooperative									
Alma	23,641	6,510	3,445	8,816	11,748	10,748	9,558	4,809	4,189
Genoa	43,516	28,130	8,165	13,074	13,658	12,480	11,970	6,479	8,874
J.P. Madgett	4,088	7,330	5,376	7,762	7,807	8,028	9,114	10,041	4,976
Stoneman	4,663	790	0	0	0	0	0	0	0
Madison Gas and Electric Co.									
Blount Street	8,436	3,851	6,923	5,969	2,617	2,762	2,958	397	278
Northern States Power Co.									
Bay Front	2,708	393	786	1,196	944	1,149	1,041	735	347
Wisconsin Electric Power Co.									
Oak Creek	122,472	45,650	22,831	12,903	13,594	13,695	14,472	14,823	13,032
Pleasant Prairie	4,972	26,933	28,726	33,656	28,566	2,229	1,092	988	1,195
Port Washington	42,295	4,009	15,572	2	2	4	4	6	6
Valley	41,761	14,053	15,835	8,482	7,087	6,848	6,887	5,376	4,890
Wisconsin Power and Light Co.									
Blackhawk	2,006	0	0	0	0	0	0	0	0
Columbia 1	24,937	18,616	15,056	13,729	10,616	12,093	13,561	11,833	14,527
Columbia 2	14,614	13,909	13,270	12,370	11,780	13,332	13,303	12,396	13,192
Edgewater 1-4	60,014	38,021	8,962	9,103	7,675	7,166	7,205	5,666	5,758
Edgewater 5	0	6,744	8,744	7,741	8,084	9,502	7,858	7,782	8,779
Nelson Dewey	32,304	10,985	14,275	14,999	14,519	15,064	13,531	12,646	13,454
Rock River	14,139	7,220	24	12	2	2	2	4	0
Wisconsin Public Service Corp.									
Pulliam	42,087	25,631	6,314	12,175	10,869	10,448	8,446	4,386	5,517
Weston 1, 2	21,009	6,589	3,340	3,988	3,278	2,983	2,852	2,060	2,601
Weston 3	0	7,598	8,358	9,540	9,318	6,125	7,338	5,912	7,216
Weston 4	0	0	0	0	0	0	333	972	1,120
Municipal Utilities									
Manitowoc	1,318	1,727	3,282	217	732	1,033	1,706	794	593
Marshfield	1,651	139	0	0	0	0	0	0	0
Menasha	991	695	79	0	0	0	0	0	0
Total									
Utility Sources	**513,622**	**275,523**	**189,363**	**175,734**	**162,896**	**135,691**	**133,231**	**108,105**	**110,544**
All Other Sources	**172,777**	**101,517**	**87,115**	**68,600**	**67,394**	**67,838**	**87,888**	**77,203**	**80,696**
All Stationary Sources	**686,399**	**377,040**	**276,478**	**244,334**	**230,290**	**203,529**	**221,119**	**185,308**	**191,240**
Percent Utility Sources	**74.8%**	**73.1%**	**68.5%**	**71.9%**	**70.7%**	**66.7%**	**60.3%**	**58.3%**	**57.8%**

p Preliminary estimates.

r Revised.

Source: Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, Sulfur Dioxide and Nitrogen Oxides Emissions Report PUBL-AM-343 and published by facility on the Wisconsin Department of Natural Resources website at http://dnr.wi.gov/air/emission/ObtainEmissionSummary1995ToPresent.htm (1986-2010).

Electric Utility Nitrogen Oxides Emissions

1989-2010 TONS

Year	1989	1990	2000	2005	2006	2007	2008	2009	2010[p]
Dairyland Power Cooperative									
Alma	1,934	1,962	2,774	3,834	4,252	4,883	3,671	1,100	763
Genoa	5,243	5,304	3,611	3,717	3,909	3,556	2,696	1,574	1,669
J.P. Madgett	4,728	4,963	4,845	4,469	4,098	4,114	3,962	3,636	2,898
Madison Gas and Electric Co.									
Blount Street	1,511	1,165	1,480	1,187	490	463	568	78	88
Northern States Power Co.									
Bay Front	0	0	1,288	1,527	1,171	1,590	1,562	916	665
Wisconsin Electric Power Co.									
Oak Creek	13,967	8,917	19,786	4,650	4,634	4,646	4,978	5,530	4,982
Pleasant Praire	17,701	16,356	18,452	11,318	8,745	2,560	2,862	2,623	2,711
Port Washington	1,005	771	4,074	45	85	111	129	129	131
Valley	4,414	4,874	7,259	3,893	3,435	3,268	3,106	1,817	1,446
Wisconsin Power and Light Co.									
Columbia 1	6,059	6,844	7,981	3,022	2,699	2,655	2,715	2,438	2,899
Columbia 2	7,943	10,336	6,874	2,829	2,448	2,484	2,549	2,329	2,447
Edgewater 1-4	16,583	16,684	12,817	3,781	2,726	2,697	2,805	1,409	1,503
Edgewater 5	2,960	3,638	8,743	2,282	2,276	1,976	1,698	1,552	1,791
Nelson Dewey	9,997	9,997	5,413	3,060	2,848	2,938	2,589	2,382	3,082
Rock River	4,367	3,697	419	373	125	108	88	33	6
Wisconsin Public Services Corp.									
Pulliam	6,769	7,087	8,045	9,235	8,164	8,222	6,591	3,391	2,705
Weston 1, 2	3,003	3,308	3,262	3,754	2,622	3,039	2,699	971	1,212
Weston 3	2,374	2,360	3,228	4,385	3,965	2,529	2,593	2,034	1,492
Weston 4	0	0	0	0	0	0	281	794	922
Municipal Utilities									
Manitowoc	923	923	102	88	146	278	593	245	234
Total									
Utility Sources	**111,481**	**109,186**	**120,453**	**67,449**	**58,838**	**52,117**	**48,735**	**34,981**	**33,646**
All Other Sources	**86,473**	**24,774**	**19,625**	**45,232**	**41,282**	**42,660**	**48,287**	**43,196**	**45,540**
All Stationary Sources	**197,954**	**133,960**	**140,078**	**112,681**	**100,120**	**94,777**	**97,022**	**78,177**	**79,186**
Percent Utility Sources	**56.3%**	**81.5%**	**86.0%**	**59.9%**	**58.8%**	**55.0%**	**50.2%**	**44.7%**	**42.5%**

p Preliminary estimates.

Source: Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, Sulfur Dioxide and Nitrogen Oxides Emissions Report PUBL-AM-343 and published by facility on the Wisconsin Department of Natural Resources website at http://dnr.wi.gov/air/emission/ObtainEmissionSummary1995toPresent.htm (1986-2010).

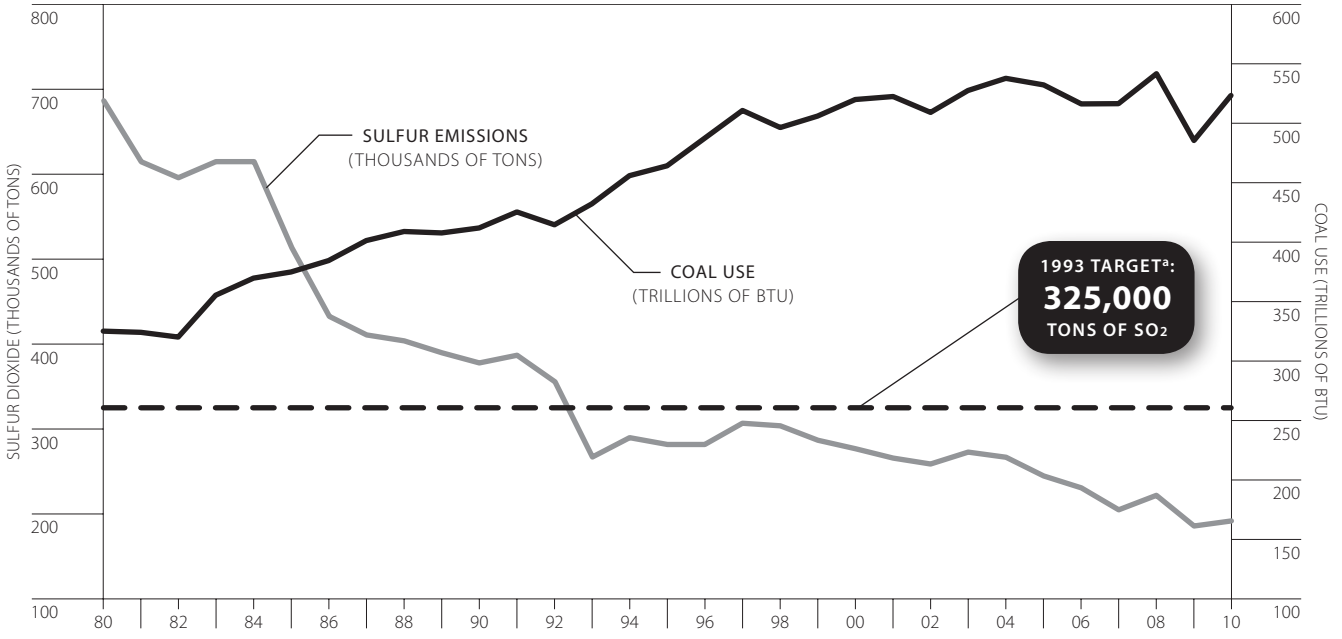
NITROGEN OXIDES EMISSIONS 3.8%

Utility nitrogen oxides emissions decreased 3.8 percent from 2009 to 2010. Future decreases in total emissions will depend on the growth in coal fired generation, old plant retirement, the effectiveness of future energy efficiency efforts, increased use of natural gas and renewable energy, and the disposition of proposed US EPA rules.

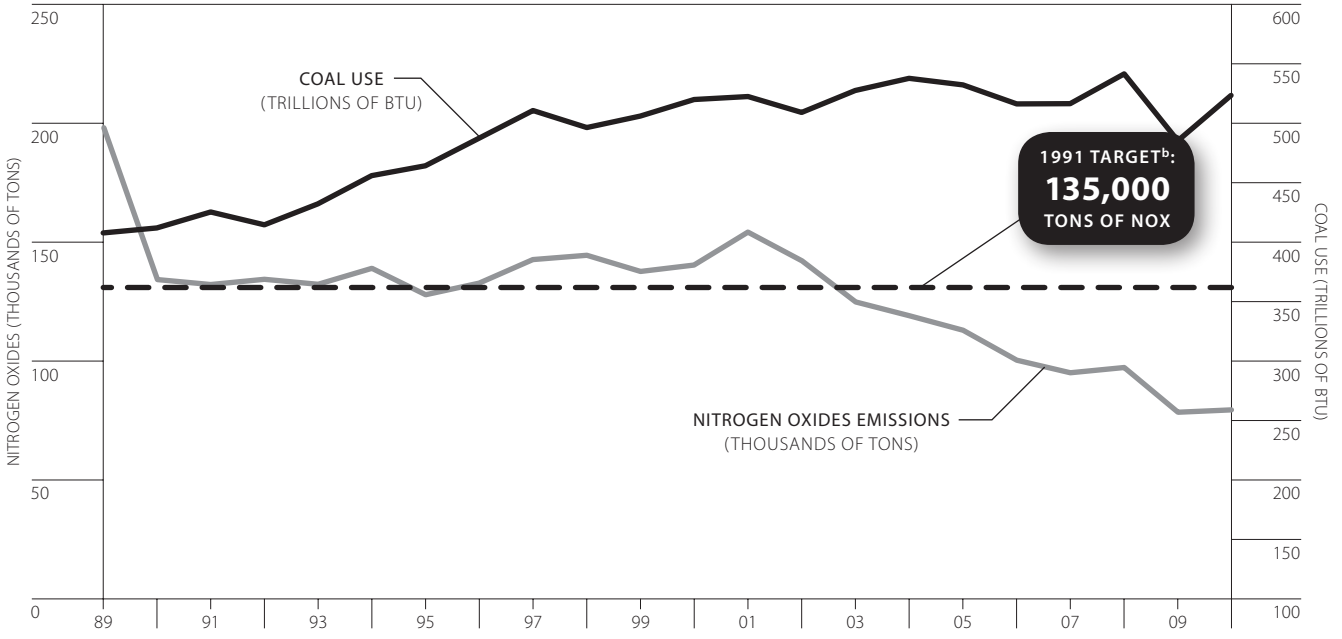
Recent changes in combustion technology have resulted in reduced NOX emissions for some generating plants.

Wisconsin Sulfur Dioxide and Nitrogen Oxides Emissions and Coal Use

1980-2010 SULFUR DIOXIDE EMISSIONS AND COAL USE



1989-2010 NITROGEN OXIDES EMISSIONS AND COAL USE



a 1993 target established in Wisconsin Statutes, 285.45(2)(a). http://www.legis.state.wi.us/statutes/Stat0285.pdf. Target is for all major utilities and large sources.

b 1991 target established in Wisconsin Statutes, 285.47(2). http://www.legis.state.wi.us/statutes/Stat0285.pdf. Target is for all major utilities.

Source: Wisconsin State Energy Office.

Wisconsin Utility Power Plant Inventory, 2010

Utility / Site[a]	Nameplate Capacity (MW)	Number of Units	Primary Fuel
Dairyland Power Cooperative			
Alma 1-3	58.1	3	Coal, Oil
Alma 4, 5	136.0	2	Coal, Oil
Elk Mound	71.0	2	Gas
Flambeu	22.0	3	Hydro[b]
Genoa 3	345.6	1	Coal, Oil
J.P. Madgett	387.0	1	Coal, Oil
Seven Mile Creek	4.1	3	LFG[i]
Various Biogas Methane	1.6	2	Gas
Madison Gas and Electric Co.			
Blount Street 3, 4, 5, 6, 7	177.5	5	Coal, RDF[c]
Diesel	54.0	1	Oil
Fitchburg 1, 2	57.6	2	Gas
Nine Springs	16.2	1	Gas
Rosiere	11.2	17	Wind
Sycamore	41.6	2	Gas
Various Solar	0.06	8	Solar
West Campus	169.3	3	Gas
Northern States Power Co.			
Bay Front 4, 5, 6	67.2	3	Wood, Coal
Flambeau	16.0	1	Gas
French Island 1, 2	30.4	2	Wood, RDF[c]
French Island 3, 4	157.6	2	Oil
Various Hydro	240.9	58	Hydro[b]
Wheaton 1-6	322.2	6	Gas, Oil
Shared Ownership			
Columbia 1[f]	512.0	1	Coal
Columbia 2[f]	511.0	1	Coal
Edgewater 4[g]	330.0	1	Coal
Edgewater 5[h]	380.0	1	Coal
Elm Road C1[k]	600.2	2	Coal
W. Marinette 33[e]	83.5	1	Gas
Weston 4[d]	595.0	1	Coal

Utility / Site[a]	Nameplate Capacity (MW)	Number of Units	Primary Fuel
Wisconsin Electric Power Co.			
Blu Sky Green Field	145.2	88	Wind
Byron	1.3	2	Wind
Concord	381.2	4	Gas
Germantown 1, 2, 3, 4	294.8	4	Oil
Germantown 5	106.9	1	Gas
Milwaukee	11.0	1	Coal
Paris	437.2	4	Gas
Pleasant Prairie 1, 2	1233.0	2	Coal
Pleasant Prairie 3	2.0	1	Oil
Port Washington 1-3	1182.0	3	Gas
S. Oak Creek 5-8	1191.6	4	Coal
Valley 1, 2	272.0	2	Coal
Valley 3	2.7	1	Oil
Various Hydro	13.6	8	Hydro[b]
Various Solar	0.003	3	Solar
Wisconsin Power and Light Co.			
Blackhawk 3, 4	50.0	2	Gas
Cedar Ridge	67.7	41	Wind
Edgewater 3	60.0	1	Coal
Nelson Dewey 1, 2	200.0	2	Coal
Rock River 1, 2	150.0	2	Gas
Rock River 3-6	144.0	4	Gas
Sheepskin	40.0	1	Gas
South Fond Du Lac	344.0	4	Gas
Superior Glacial Ridge	2.0	2	LFG[i]
Various Hyrdo	36.6	11	Hydro[b]
Various Solar	0.01	5	Solar

Utility / Site[a]	Nameplate Capacity (MW)	Number of Units	Primary Fuel
Wisconsin Public Services Corp.			
DePere	187.2	1	Gas
Eagle River	4.0	2	Oil
Glacier Hills Wind	162.0	90	Wind
Glenmore	1.2	2	Wind
Lincoln	9.2	14	Wind
Oneida Casino	4.0	2	Oil
Pulliam 31	91.0	1	Gas
Pulliam 5-8	350.2	4	Coal
Various Hydro	57.2	38	Hydro[b]
Various Solar	0.05	8	Solar
W. Marinette 31, 32, 34	166.6	3	Gas
Weston 1-3	492.1	3	Coal
Weston 31, 32	76.3	2	Gas
Municipal Utilities			
Manitowoc, City of	127.4	4	Coke
Manitowoc, City of	5.5	1	Gas
Menasha, City of	28.0	3	Coal
Merchant/IPP			
Kewaunee	560.1	1	Nuclear
Point Beach	1073.6	1	Nuclear
Statewide Utilities			
Statewide	105.4	36	Biomass, Biogas, Solar
Statewide	7997.7	45	Coal
Statewide	370.3	118	Hydro[b]
Statewide	4083.3	54	Natural Gas
Statewide	519.1	13	Oil
Statewide	397.8	164	Wind
Statewide Totals[j]	13473.6	430	All

a Does not include non-utility generation, all electric cooperative or all municipal utility. This chart shows only in-state generation and does not include out of state generation owned by Wisconsin utilities.

b Hydroelectric capacity differs from sums on other tables due to different data sources

c RDF is Refuse Derived Fuel.

d The Weston 4 unit is owned by Wisconsin Public Service Corp. (70%) and Dairyland Power Cooperative (30%).

e The West Marinette 33 unit is jointly owned by Wisconsin Public Service Corp. (68%) and the City of Marshfield (32%).

f The Columbia 1 and 2 units are owned by Alliant Energy (46.2%), Wisconsin Public Service Corp. (31.8%) and Madison Gas & Electric Co.(22.0%).

g The Edgewater 4 unit is owned by Alliant Energy (68.2%) and Wisconsin Public Service Corp. (31.8%).

h The Edgewater 5 unit is owned by Alliant Energy (75%) and Wisconsin Electric Power Co. (25%).

i LFG is Landfill Gas

j Statewide totals here are slightly different from capacity totals on other pages in this section because this table does not include nuclear reactors. Nuclear reactors are not included because they are owned by Independent Power Producers, not utilities.

k The Elm Road C1 unit is owned by Wisconsin Electric Power Co. (81.67%), WPPI Energy (10%) and Madison Gas and Electric (8.33%).

Source: U.S. Department of Energy, Energy Information Administration, Existing Electric Generating Units in the United States by State, Company and Plant, http://www.eia.doe.gov/cneaf/electricity/page/capacity/capacity.html (through 2007); Public Service Commission of Wisconsin, unpublished data (2008); Annual report of Dairyland Power Cooperative submitted to the U.S. Department of Agriculture, Rural Utilities Service (2008-2009).